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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PHAM, THOMAS K

ART UNIT	PAPER NUMBER
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2121

9

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,445

Applicant(s)

ERYUREK ET AL.

Examiner

Thomas K Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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Response to Amendment

1. This action is in response to the amendment filed on 3/24/2004.
2. Applicant's arguments, see pages 8-11, filed 3/24/2004, with respect to the rejection(s) of claim(s) 1-35 under the statutory basis for the previous rejection have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Beaverstock et al. U.S. Patent 5,134,574.

DETAILED ACTION

Priority

3. Acknowledgment is made of applicant's claim for domestic priority under 35 U.S.C. 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7, 12-32 and 34-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,533,413 ("Kobayashi") in view of U.S. Patent No. 5,134,574 ("Beaverstock").

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Regarding claims 1 and 26

Kobayashi teaches a method of using a degradation level of a process entity within a process plant, comprising: estimating a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, “an equipment state model ... life time state”). Kobayashi does not teach comparing the estimated level of the degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the first time; and altering the operation of the process entity based on the comparison step to drive an estimated level of degradation of the process entity at a second time after the first time to be approximately equal to a predetermined desired level of degradation of the process entity at the second time, wherein the predetermined desired level of degradation of the process entity at the second time is greater than the predetermined desired level of degradation of the process entity at the first time. However, Beaverstock teaches comparing the calculated level of operation with a predetermined target value (col. 8 lines 44-63, “to construct the calculation ... to provide ideal operation/performance) and adjusting the control process toward target performance based on the comparison result (col. 16 lines 4-28, “In an algorithm block 63 ... predefined target measures”) for the purpose of adjusting the control process toward the target performance. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the comparison of Beaverstock with the system of Kobayashi because it would provide for the purpose of adjusting the control process toward the target performance to achieve ideal performance.

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Regarding claims 2, 18 and 29

Kobayashi teaches estimating the level of degradation includes using a model of the process entity to estimate the level of degradation of the process entity (col. 7 lines 9-20, “a deterioration model for ... may be delayed”).

Regarding claims 3, 19 and 30

Kobayashi and Beaverstock teach estimating the level of degradation of the process entity, comparing the estimated level of degradation of the process entity at the first time to the predetermined desired level of degradation of the process entity at the first time (see Beaverstock col. 8 lines 44-63, “to construct the calculation ... to provide ideal operation/performance), and altering the operation of the process entity based on the comparison (see Beaverstock col. 16 lines 4-28, “In an algorithm block 63 ... predefined target measures”) are each repeated at various times during the operation of the process entity for different times (see Kobayashi col. 6 lines 22-33, “Through the calculation ... reaches a predetermined value”).

Regarding claims 4, 20 and 31

Kobayashi and Beaverstock teach designating a fiducial line including a plurality of points, each point defining a predetermined desired level of degradation of the process entity at a different time and wherein comparing includes using the fiducial line to determine the predetermined desired level of degradation of the process entity at the first time and altering the operation of the process entity includes using the fiducial line to determine the predetermined desired level of degradation of the process entity at the second time (see Kobayashi col. 6 lines 53-66, “the relationship between ... deterioration estimation”).

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Regarding claims 5 and 21

Kobayashi teaches altering the fiducial line during operation of the process entity to thereby change the desired level of degradation at one of the first or second times (col. 8 lines 44-54, "A model or module ... to the respective graphs").

Regarding claims 6, 22 and 32

Kobayashi teaches the fiducial line defines a plurality of points between a clean and a fouled condition of the process entity (col. 6 lines 53-66, "the relationship between ... deterioration estimation").

Regarding claims 7 and 23

Kobayashi teaches altering the operation of the process entity includes using an optimization procedure to alter the operation of the process entity (col. 10 lines 56-62, "when deterioration model ... with reference to FIG. 13").

Regarding claims 12, 24 and 27

Kobayashi teaches using a result of the comparison to produce an index defining a utilization of the process entity (col. 7 lines 54-60, "A model correction ... extinguished or reduced").

Regarding claims 13 and 25

Kobayashi teaches altering the operation of the process entity includes defining a line between the estimated level of degradation of the process entity at the first time and the predetermined desired level of degradation at the second time and using the defined line to alter the operation of the process entity (col. 8 lines 44-54, "A model or module .. respective graphs").

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Regarding claim 14

Kobayashi teaches using the defined line includes using the slope of the defined line (col. 9 lines 16-22, "Each module constituting ... stress S is increased").

Regarding claims 15 and 34

Kobayashi teaches collecting data indicative of the process parameters from multiple data sources (col. 7 lines 40-47, "A stress information ... deterioration model portion 1").

Regarding claims 16 and 35

Kobayashi teaches collecting data includes collecting process control data and collecting process maintenance data (col. 7 lines 48-53, "A memory means 3 ... from memory means 3").

Regarding claim 17

Kobayashi teaches a process control system adapted to use a degradation level of a process entity within a process plant that has a processor communicatively connected to multiple process devices, comprising: a memory (col. 4 lines 21-23, "A memory means 3 ... of the equipment"); a first routine stored on the memory and adapted to be executed on the processor to estimate a level of degradation of the process entity at a first time based on one or more process parameters associated with the process entity (col. 3 line 66 to col. 4 line 12, "an equipment state model ... life time state"). Kobayashi does not teach a second routine stored on the memory and adapted to be executed on the processor to compare the estimated level of degradation of the process entity at the first time to a predetermined desired level of degradation of the process entity at the; and a third routine stored on the memory and adapted to be executed on the processor to determine an alteration for the operation of the process entity based on the comparison of the second routine to drive an estimated level of degradation of the process entity at a second time after the first time

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to be approximately equal to a predetermined desired level of degradation of the process entity at the second time, wherein the predetermined desired level of degradation of the process entity at the second time is greater than the predetermined desired level of degradation of the process entity at the first time.

Regarding claim 28

Kobayashi teaches altering the operation of the process entity includes changing the operation of the process entity to drive the utilization index to be a predetermined amount at a second time after the first time (col. 5 lines 1-13, "Through calculation of ... predetermined threshold value").

6. Claims 8-11 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi in view of Beaverstock and further in view of U.S. Patent No. 5,877,954 ("Klimasauskas").

Regarding claims 8 and 33

Kobayashi and Beaverstock teach estimating the level of degradation of the process entity within a process plant but does not teach a furnace within the process plant. However, Klimasauskas teaches a refinery or a chemical processing plant (col. 4 lines 40-43, "the representative plant is ... flow rate variables") for the purpose of increasing the process control model's accuracy and usability. Therefore, it is obvious to one of ordinary skill in the art at the time the invention was made to incorporate processing plant of Klimasauskas with the degradation level estimation of Kobayashi and Beaverstock because it would provide for the purpose of increasing the process control model's accuracy and usability.

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Regarding claim 9

Klimasauskas teaches altering the operation of the process entity includes changing a flow rate through the furnace (col. 4 lines 55-57, "The collected data ... by a flow meter 78").

Regarding claim 10

Klimasauskas teaches altering the operation of the process entity includes changing a temperature associated with the furnace (col. 4 lines 47-55, "the collected data ... measured by analyzers").

Regarding claim 11

Klimasauskas teaches altering the operation of the process entity includes changing an amount of steam injected into the furnace (col. 4 lines 55-59, "The collected data ... controlled by a valve 86").

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (703) 305-7587 and fax number is (703) 746-8874. The examiner can normally be reached on Monday-Thursday and every other Friday from 7:30AM- 5:00PM EST or contact Supervisor, *Mr. Anthony Knight*, can be reached on (703) 308-3179.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Thomas Pham
Patent Examiner

TP

June 7, 2004


Anthony Knight
Supervisory Patent Examiner
Group 3600